

TIV

TECHNICAL GUIDANCE

FB-5000

FLOAT TYPE LEVEL SWITCH

OUTLINE

FB-5000 is a float type level switch which is installed at tank side through a nozzle or through an external chamber. The float follows liquid level and integrated reed switch is actuated through magnet coupling when the liquid level reaches at the set point. This reed switch contact may be utilized for the pump control, valve control, alarm message etc. for safety and automatic operation of various processes.

FEATURES

- ❑ Compact and durable design
- ❑ Perfect isolation between process and electric compartment for safety by magnet coupling
- ❑ SUS316 liquid wetting parts for high anti-corrosive capability
- ❑ High pressure rating
- ❑ Easy handling and installation
- ❑ Few moving parts and excellent durability

MODEL CODE

Model code		Description
FB-509		
Connection	1	R1 1/2 screw
	2	40AJIS10K flange
	3	1 1/2" JPI #150 flange
	4	1 1/2" ANSI #150 flange
	5	Others
Enclosure	W	Weather proof
	WP	Weather proof with JIS F15b gland * 1
	E	Flame proof (d2G4)
	EP	Flame proof (d2G4) with gland * 2
	S	Intrinsically safe (Ex ia IIC T6, with IS relay)
	SP	Intrinsically safe (Ex ia IIC T6, with IS relay) with JIS F15b gland * 1
Material	1	Refer to Table 1, Screw connection
	2	Refer to Table 1, Flange connection
	3	Refer to Table 1, Flange connection
	4	Refer to Table 1, Flange connection
Switch action	H	HC (LO) *3
	L	HO (LC) *3

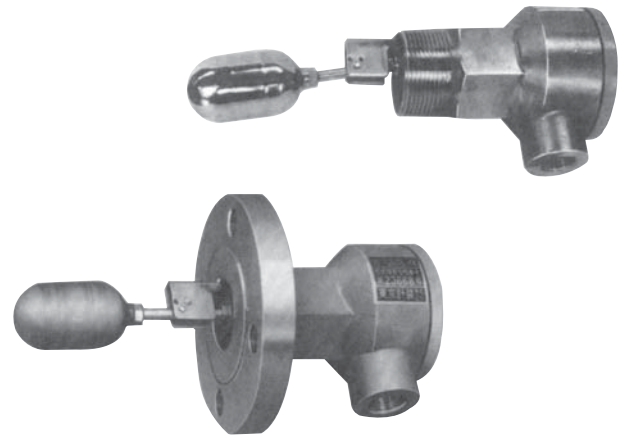
* 1: For models with a cable gland, the outer diameter of applicable cables ranges from ø9 to ø9.9.

For models with a watertight cable gland (shipbuilding), the outer diameter of applicable cables ranges from ø9 to ø9.9.

* 2: Five gaskets of a different inner diameter are included (with a washer and a seal for each).

Gasket	Applicable cable O.D.	Gasket I.D.
Assembled in the cable gland	ø10 to ø11	ø11
Spare gasket (1)	ø11 to ø12	ø12
Spare gasket (2)	ø9 to ø10	ø10
Spare gasket (3)	ø8 to ø9	ø9
Spare gasket (4)	ø7 to ø8	ø8

* 3: Refer to SWITCH ACTION for further details.

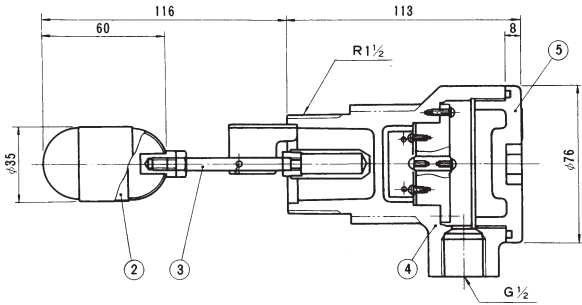


STANDARD SPECIFICATION

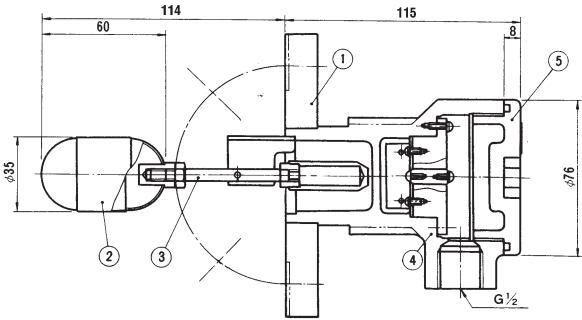
- Measuring object : Liquid Density $\geq 0.7 \text{g/cm}^3$
(Special design for Density $\geq 0.4 \text{g/cm}^3$ available on request)
- Max. Op. Press : 2MPa, but within flange rating
- Max. Liquid temp. : -5°C to 90°C (Available up to 100°C on request)
- Ambient temperature : 0 to 60°C
0 to 40°C (Flame proof)
0 to 40°C (Intrinsically safe)
- Installation : Standard : Tank side installation
R1 1/2, 40AJIS10K, 1 1/2" JPI #150, 1 1/2" ANSI #150, or Flange 50A or more
Option; Through External chamber
Consult factory for further details of external chamber
- Switch action : Close for increase (HC, LO) or close for decrease (LC, HO) Factory set
- Repeatability : Within $\pm 5 \text{mm}$
- Reset span : Max. 6mm (For liquid with a density of 1g/cm^3 ; cannot be changed.)
- Contact : Reed switch (SPST)
Capacity : AC 10VA, DC 10W (Resistance load)
Max. voltage : 100V AC/DC
Max. current : 0.5A AC/DC
Contact protection : Surge suppressor provided as standard (Except for intrinsically safe explosion-proof enclosure)
- Enclosure : Weather proof, flame proof (d2G4) or Intrinsically safe (Ex ia IIC T6, with IS relay)
- Protection class : Equiv. to IP65
- Mass : Approx. 2 kg (screw connection model)
- Cable entry : Standard G1/2 thread (Watertight gland or flameproof gland available as option)
- Cable termination : By M3 screw
- Material :
Float : SUS316
Float rod : SUS316
Flange : Carbon steel, SUS304, or SUS316
Housing : SCS14
Cover : AC2A

DIMENSION

□ FB-5091 (Screw connection)

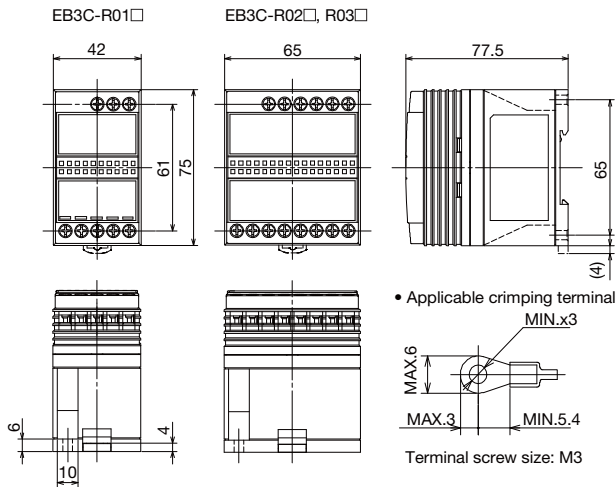


□ FB-5092, 3, 4 (Flange connection)



□ IS relay

EB3C Dimensions



□ IS relay Standard Specification

Explosion protection	Intrinsically safe Ex ia IIC
Rated operating voltage	12 V DC ±10%
Rated operating current	10 mA DC ±20%
Installation location	Non-hazardous area
Contact configuration	1a contact
Relay output	250 V AC, 3 A
(Resistance load)	24 V DC, 3 A
Contact allowable power	750 VA AC
(Resistance load)	72 W DC
Insulation resistance	500 V DC at 10 MΩ
Withstand voltage	1500 V AC (1 min.)

Model code		Description	
EB3C-	R	□□ □	Model
Output type	R		Relay output
No. of contact		01	1 point use
		02	2 points use
		03	3 points use
Power supply		AN	100 V AC to 240 V, 50/60 Hz
		DN	24 V DC

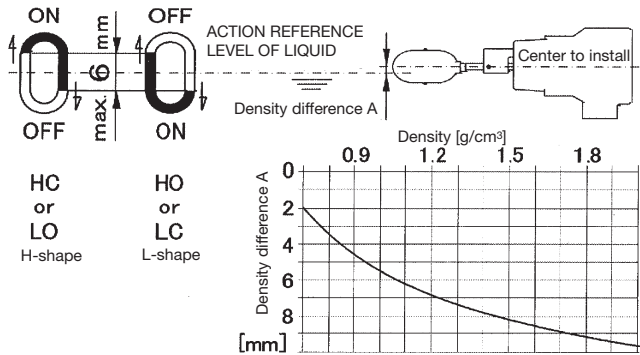
MATERIAL

	FB-509 □□1□	FB-509 □□2□	FB-509 □□3□	FB-509 □□4□
① Flange	— *1	Carbon steel*2	SUS304	SUS316
② Float	SUS316			
③ Float rod	SUS316			
④ Housing	SCS14			
⑤ Cover	AC2A			

*1 : Screw connection, flange is not provided

*2 : SS400 for JIS flanges and A105 for JPI and ANSI flanges

SWITCH ACTION



HC : Close for increase
LO : Open for decrease

HO : Open for increase
LC : Close for decrease

ORDERING INFORMATION

When ordering, specify the following.

• Model

FB-509□□-□□
 ↘ (5 : _____)

Measuring object

Density (g/cm³)

Temperature (°C)

Pressure (MPa)

Switch action HC LO LC HO

• Others, if any

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PRECAUTIONS FOR USE

- 1) Bolts, nuts and gaskets for process connection are customers scope.
- 2) In case FB-5000 is installed onto tank nozzle, the inner diameter of nozzle is to be more than 41 mm and the axis of level switch and that of nozzle are to be on the same position.
- 3) In case there is flow in liquid by a stirring machine, there may be malfunction and damage. Install an inner chamber.
- 4) In case lamps, motors, induction load or cables having more than 10m in length are connected, the reed switch contact may be fused by the surge current. It is recommended to use Tokyo Keiso's RD-1000 type Relay Driver for contact protection.
- 5) It is not suitable to use under such operating conditions as the liquid freezes, congeals or sticks

* Specification is subject to change without notice.



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